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# Technical Safety Requirements for the Waste Storage Facilities May 2014

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## Disclaimer



This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

**LLNL-TR-653209**

# Technical Safety Requirements for the Waste Storage Facilities

**May 2014**

**Lawrence Livermore National Laboratory**

# Weapons and Complex Integration

## Radioactive and Hazardous Waste Management



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**Weapons and Complex Integration**
**Radioactive and Hazardous Waste Management**

# Technical Safety Requirements for the Waste Storage Facilities

**May 2014**

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# INTRODUCTION

This document contains the Technical Safety Requirements (TSR) for the Radioactive and Hazardous Waste Management (RHWM) WASTE STORAGE FACILITIES, which include Area 625 (A625) and the Building 693 (B693) Yard Area of the Decontamination and Waste Treatment Facility (DWTF) at LLNL. The TSRs constitute requirements for safe operation of the WASTE STORAGE FACILITIES. These TSRs are derived from the *Documented Safety Analyses for the Waste Storage Facilities* (DSA) (LLNL 2011). The analysis presented therein concluded that the WASTE STORAGE FACILITIES are low-chemical hazard, Hazard Category 2 non-reactor nuclear facilities. The TSRs consist primarily of inventory limits and controls to preserve the underlying assumptions in the hazard and accident analyses. Further, appropriate commitments to safety programs are presented in the administrative controls sections of the TSRs.

The WASTE STORAGE FACILITIES are used by RHWM to handle and store hazardous waste, TRANSURANIC (TRU) WASTE, LOW-LEVEL WASTE (LLW), mixed waste, California combined waste, nonhazardous industrial waste, and conditionally accepted waste generated at LLNL as well as small amounts of waste from other DOE facilities, as described in the DSA. In addition, several minor treatments (e.g., size reduction and decontamination) are carried out in these facilities.

The WASTE STORAGE FACILITIES are located in two portions of the LLNL main site. A625 is located in the southeast quadrant of LLNL. The A625 fence line is approximately 225 m west of Greenville Road. The B693 Yard Area, which includes Building 693 (B693), Building 696 Radioactive Waste Storage Area (B696R) and associated yard and storage areas located in the northeast quadrant of LLNL in the DWTF complex. The B693 Yard Area fence line is approximately 90 m west of Greenville Road. A625 and the B693 Yard Area are subdivided into various facilities and storage areas, including of buildings, tents, other structures, and open areas as described in Chapter 2 of the DSA. Chapter 2, Section 2.4 of the DSA provides an overview of the buildings, structures, and areas in the WASTE STORAGE FACILITIES, including construction details such as basic floor plans, equipment layout, construction materials, controlling dimensions, and dimensions significant to the hazard and accident analyses.

Chapter 5 of the DSA documents the derivation of the TSRs and operational limits that protect the safety envelope defined for the WASTE STORAGE FACILITIES. This TSR document is applicable to the handling, storage, and treatment of hazardous waste, TRU WASTE, LLW, mixed waste, California combined waste, nonhazardous industrial waste, and conditionally accepted waste received or generated in the WASTE STORAGE FACILITIES. Section 5 of the TSR (Administrative Controls) contains the SPECIFIC ADMINSITRATIVE CONTROLS and Programmatic Administrative Controls necessary to ensure safe operation of the WASTE STORAGE FACILITIES.

This Introduction to the WASTE STORAGE FACILITIES TSRs is not part of the TSR limits or conditions. It contains no requirements related to WASTE STORAGE FACILITIES operations or to the safety analyses described in the DSA.

# SECTION 1
# USE AND APPLICATION

## 1.1 DEFINITIONS

**Note:** Terms defined in this list appear in uppercase type throughout these Technical Safety Requirements (TSRs).

| Term | Definition |
|---|---|
| B625 TRU WASTE CONTAINER STORAGE FOOTPRINT | A 86-ft x 32-ft footprint area. This footprint encompasses 5 rows of 21 pallets (4-ft x 4-ft) with a minimum of 2.5-ft spacing aisle space between rows as documented in calculation WSF-AIRCRAFT-FREQUENCY-B625-TRU-1428 (Laycak (2014a). This area includes the 1-ft width of the berm. |
| B696R TRU WASTE CONTAINER STORAGE FOOTPRINT | A 65-ft x 46-ft footprint area. This footprint encompasses 7 rows of 16 pallets (4-ft x 4-ft) with a minimum of 2.5-ft spacing aisle space between rows as documented in calculation WSF-AIRCRAFT-FREQUENCY-B696R-TRU-1429 (2014b). |
| COLLECTION OF COMBUSTIBLES | A group of combustible items that are physically contiguous or within a close enough proximity that if one item caught on fire, the others have a significant possibility of catching on fire as well.<br>**Exception 1:** The B625 phone board is not considered a “collection of combustibles.” The B625 phone board has its own separation distance limits in its own SAC.<br>**Exception 2:** Transient combustibles from operations (e.g., tires on electric vehicles, workers and their personal equipment/clothing) are not considered a “collection of combustibles.” |

| Term | Definition |
|---|---|
| DE MINIMIS COMBUSTIBLES | Small, isolated combustibles that could not pose a high fire risk and would not generate enough heat to impact nearby waste containers or have the capability to propagate a fire to a COLLECTION OF COMBUSTIBLES. This explicitly includes:<br>• Container labels/associated paperwork.<br>• Waste containerized in metal containers.<br>• Life safety systems (e.g., exit signs, fire alarms, fire control panels, safety signage).<br>• Standard building utilities (e.g., plastic light switch covers, electrical outlet covers, light wiring, plastic/paper signs, phones).<br>• Small spray lubricants, adhesives and paints needed for maintenance and waste labeling activities.<br>• Small worker tools (e.g., tape measure, clip board, PPE, small plastic sample bottles, tape, miscellaneous personal electronic devices, and other miscellaneous small maintenance materials). |
| EXCLUSION ZONE | A marked spacing area where no storage, staging of material or parking of vehicles may occur other than for maintenance activities.<br>**Note 1:** Transient transfers across the EXCLUSION ZONE are allowed. Direct transfers of materials across the spacing area are infrequent. Only transient transfers may occur across the EXCLUSION ZONE. No storage or temporary staging of materials (e.g., radiological, chemical, combustible) or parking of vehicles is allowed within the ZONE. Vehicles may not be temporarily parked in the EXCLUSION ZONE during operations to load or unload materials or equipment. The only exceptions to the above restrictions are during EXCLUSION ZONE maintenance activities and transfer activities that require the presence of vehicles or materials. During all such cases, any vehicles or materials will not be left unattended during operations and all materials and equipment will be removed from the spacing area by the end of the day.<br>**Note 2:** As a defense-in-depth measure, the EXCLUSION ZONE is expanded between adjacent roll-up doors between B696S and B696R near the segment boundary. This further reduces the possibility of fires migrating between the roll-up doors. |
| LOW-LEVEL WASTE (LLW) | Waste containing radioactive components that do not meet the definition of TRANSURANIC (TRU) WASTE. |
| MAY | Denotes an acceptable, but not required, way to maintain the requirements, assumptions, or conditions of the facility safety basis. |

| Term | Definition |
|---|---|
| PLUTONIUM-239 EQUIVALENT CURIE (PE-Ci) | A unit of radiological activity. PE-Ci values are determined from summing the Curie value of radionuclides that have been normalized to plutonium-239 Solubility Class S based on the Dose Conversion Factors of International Commission on Radiological Protection Publication 71/72 (ICRP-71/72), as described in calculation WSF-DCF-1104 (Laycak 2011). |
| SHALL | Denotes a mandatory requirement that must be complied with. |
| SHOULD | Denotes a responsibility to either follow the TSR as specified or in a manner that meets the intent of the TSR. The use of “should” recognizes there may be site- or facility-specific attributes that warrant special treatment and that literal compliance with the TSR may not be required to maintain the requirements, assumptions, or conditions of the facility safety basis. |
| SPECIFIC ADMINISTRATIVE CONTROL (SAC) | An AC that provides a specific preventive or mitigative function for accident scenarios identified in the DSA where the safety function has importance similar to, or the same as, the safety function for a safety SSC (e.g., discrete operator actions, combustible loading program limits, hazardous material limits protecting hazard analysis or facility categorization). |
| TRANSURANIC (TRU) WASTE | Without regard to source or form, waste that is contaminated with alpha-emitting transuranic radionuclides (elements above uranium in the periodic table [i.e., atomic number greater than 92]) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. |

| Term | Definition |
|---|---|
| TRU WASTE CONTAINER | Following is a description of the containers satisfying the performance criteria for Type A packaging (see 49 CFR 173.465 for the applicable package mass) used to store TRU WASTE in the WASTE STORAGE FACILITIES.<br>DOT 17C, 17H or UN1A2 steel drums with vents (waste containers accepted as LLW and converted to TRU WASTE after assay are not required to have vents).<br>Standard Pipe Overpack Containers (POCs) consisting of a capped steel pipe equipped with a vent and packed into a standard 55-gallon steel drum (Washington TRU Solutions LLC, 2012).<br>Standard waste boxes (SWBs) refer to oval-shaped steel containers with vents, roughly 3-ft H $\times$ 6-ft L $\times$ 4.5-ft W, designed for efficient loading into TRUPACT II Type B shipping containers.<br>TRU oversize boxes refer to unvented steel containers that are rectangular in shape. Built to contain large pieces of contaminated equipment, the dimensions of each TRU oversize box are unique. Heights vary from approximately 53-in. to 101-in., widths vary from approximately 47-in. to 70-in., and lengths vary from approximately 78-in. to 138-in.<br>Other steel containers with vents satisfying the free drop test performance criteria for Type A packaging (e.g., ten drum overpacks, 85-gal drums). |
| WASTE STORAGE FACILITIES | A collective term referring to Building 696R (B696R), Building 625 (B625), Building 693 (B693), the B693 Yard Area, and the Area 625 (A625) Yard Area. |

## 1.2 OPERATIONAL MODES

Facility modes are not required since there are no Limiting Conditions for Operation. The mission of these facilities will be performed throughout their operational lifetime. RHWM has determined that this section is not applicable to the WASTE STORAGE FACILITIES. This section was retained for consistency with the TSR numbering system.

## 1.3 FREQUENCY NOTATION

No Surveillance Requirements have been identified as necessary to support the safety analysis for the WASTE STORAGE FACILITIES; therefore, no frequency notations have been included in this TSR. This section was retained for consistency with the TSR numbering system.

## 1.4 ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms are used in this document.

| Abbreviation or Acronym | Definition |
|---|---|
| AC | Administrative Control |
| CFR | Code of Federal Regulations |
| Ci | Curies |
| DOE | U.S. Department of Energy |
| DOT | U.S. Department of Transportation |
| DSA | Documented Safety Analyses |
| DWTF | Decontamination and Waste Treatment Facility |
| ES&H | Environment, Safety, and Health |
| FSP | Facility Safety Plan |
| LCO | Limiting Condition for Operation |
| LLNL | Lawrence Livermore National Laboratory |
| LLW | Low-level waste |
| NEPA | National Environmental Policy Act |
| PC-2 | Performance Category 2 |
| PE-Ci | Plutonium-equivalent Curie |
| QA | Quality Assurance |
| RHWM | Radioactive and Hazardous Waste Management |

| Abbreviation or Acronym | Definition |
|---|---|
| SAC | Specific Administrative Control |
| SCIL | Single Container Inventory Limit |
| SL | Safety Limit |
| SR | Surveillance Requirement |
| SSCs | Structures, systems, and components |
| TRU | Transuranic |
| TSR | Technical Safety Requirement |
| USQ | Unreviewed Safety Question |
| W&CI | Weapons and Complex Integration |

## 1.5 SAFETY LIMITS

No safety limits (SL) have been identified as necessary to support the safety analysis for the WASTE STORAGE FACILITIES; therefore, none has been included in this TSR document. Although SLs are not applicable to the WASTE STORAGE FACILITIES, the section is retained for consistency with the TSR section numbering system.

## 1.6 LIMITING CONTROL SETTINGS

There are no SLs for operation of the WASTE STORAGE FACILITIES; therefore, limiting control settings are not applicable. This section is retained for consistency with the TSR section numbering system.

## 1.7 LIMITING CONDITIONS FOR OPERATION

No limiting conditions for operations (LCOs) have been identified as necessary to support the safety analysis described in the WASTE STORAGE FACILITIES DSA; therefore, none are included in this TSR document. This section is retained for consistency with the TSR section numbering system.

## 1.8 SURVEILLANCE REQUIREMENTS

No surveillance requirements (SRs) have been identified as necessary to support the safety analysis described in the WASTE STORAGE FACILITIES DSA; therefore, none are included in this TSR document. This section is retained for consistency with the TSR section numbering system.

# SECTION 2
# SAFETY LIMITS

## 2.1 SAFETY LIMITS

There are no safety limits.

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# SECTION 3/4
# LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

## 3/4.1 GENERAL APPLICATION

There are no limiting conditions for operations (LCOs) or related surveillance requirements (SRs).

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# SECTION 5
# ADMINISTRATIVE CONTROLS

Portions of the various programs outlined in this section form the basis under which the WASTE STORAGE FACILITIES ensure that Conduct of Operations are properly performed to protect the public, workers, and the environment.

## 5.1 CONTRACTOR RESPONSIBILITY

The Facility Manager is responsible for the following:

- Overseeing and assuring that all activities in the WASTE STORAGE FACILITIES are conducted safely.
- Ensuring personnel working in the WASTE STORAGE FACILITIES follow the requirements in the safety basis documents (e.g., DSA, TSR, SER).
- Preparing the Facility Safety Plan (FSP) for the WASTE STORAGE FACILITIES. The FSP governs the Environment, Safety and Health (ES&H) controls for all work performed in the WASTE STORAGE FACILITIES and provides for the Facility Manager's approval of operations as specified.
- Assuring that procedures are prepared and implemented in accordance with the LLNL *ES&H Manual*, and concurring with these procedures.
- Implementing a document control system that ensures documents essential to continued safe operation are prepared, reviewed, approved (if necessary), and maintained in a retrievable manner.
- Ensuring that WASTE STORAGE FACILITIES personnel have completed their required training.
- Approving and releasing proposed operations and experiments with all forms of radioactive and hazardous materials.

## 5.2 CONTRACTOR ORGANIZATION

The management team of LLNS, LLC operates and maintains nuclear facilities in a safe, secure, and compliant manner to effectively achieve Laboratory mission objectives. Each of these facilities is managed under a matrix organization. Weapons and Complex Integration (W&CI) has line responsibility. They execute the scope, manage the budget and schedule, and provide day to day direction of the facility managers assigned to Nuclear Operations. The nuclear facility managers are matrixed from Nuclear Operations into the W&CI principal directorate. In this role, they are accountable to the Nuclear Material Technology Program Leader for the safe and compliant operation of the facility.

## 5.3 PROCEDURES

Procedures and plans are prepared to provide direction, ensure that the WASTE STORAGE FACILITIES are operated within the evaluation basis, and support safe operation of the WASTE STORAGE FACILITIES. Each major piece of processing equipment in the WASTE STORAGE FACILITIES will have a written operational procedure. Off-normal events will be included in the operational procedures. Individual tasks will be detailed in the work permit process and processing plans will be used to meet permit requirements. Procedures and plans include, but are not limited to, the following:

- Safety plans (e.g., Facility Safety Plan).
- Maintenance procedures.
- Procedures for programs identified in Section 5.4 of the TSR, as required or as applicable.

Procedures/plans and revisions thereof are reviewed by technical support personnel and approved by facility management. Procedures/plans enter the USQ process, as required.

Temporary changes to procedures/plans may be made provided the changes are documented and reviewed, enter the USQ process, and are approved.

Document control is implemented through the Quality Assurance and Configuration Management programs.

## 5.4 ADMINISTRATIVE PROGRAMS

This section establishes programmatic administrative controls committed to in the WASTE STORAGE FACILITIES DSA.

### 5.4.1 RADIATION PROTECTION PROGRAM

A radiation protection program SHALL be established, implemented, and maintained to ensure that radiation exposure to employees, subcontractors, visitors, and members of the general public is controlled at levels specified in applicable DOE regulations and standards (10 CFR 835) and adhere to the as low as reasonably achievable (ALARA) principle. The program includes the following key elements:

- As Low As Reasonably Achievable (ALARA) program.
- Dosimetry program.
- Radiological monitoring procedures.

### 5.4.2 CRITICALITY SAFETY PROGRAM

A criticality safety program SHALL BE established, implemented, and maintained to ensure that all WASTE STORAGE FACILITIES operations and activities are reviewed, evaluated, and documented by LLNL criticality safety engineers. This program includes the following key element:

- TRU Waste Container criticality controls.
- Nuclear criticality safety training.

### 5.4.3 UNREVIEWED SAFETY QUESTION PROCESS

A process SHALL be established, implemented, and maintained to evaluate potential Unreviewed Safety Questions (USQs). Key elements of the process include the following:

- A USQ process that permits facility management to make physical and procedural changes and conduct tests and experiments without prior DOE approval as long as the changes and tests do not explicitly or implicitly affect the safety basis of the WASTE STORAGE FACILITIES or result in a change to a TSR.
- A USQ process that ensures conditions or potential conditions outside the safety basis are identified.

Chapter 5, Section 5.6.1, of the DSA lists equipment important to safety.

### 5.4.4 CONFIGURATION MANAGEMENT PROGRAM

A configuration management program SHALL be established, implemented, and maintained in accordance with the NMTP Nuclear Facility Configuration Management Plan (LLNL latest revision-b). This program includes the following key elements:

- Program management.
- Design requirements.
- Document control.
- Work Control/Change Control.
- Assessments.

### 5.4.5 FIRE PROTECTION PROGRAM

A fire protection program SHALL be established, implemented, and maintained to reduce threats to the public, workers, and the environment resulting from a fire. This program includes the following key elements:

- Routine fire protection assessments/inspections are conducted to identify fire hazards.

- Inspection, testing, and maintenance of fire protection systems (e.g., fire suppression, fire detection) are conducted.
- Use and storage of flammable liquids in B696R or B625 is restricted.
- If TRU WASTE is stored on a pallet, then the pallet shall be made of non-combustible material (e.g., metal).
- A 20-foot exclusion zone SHALL be marked between the west side of the B693 Yard Area and both the B695 yard and B696S yard, except between B696S and B696R, which are both separated by the B696S/B696R Partition.

### 5.4.6 EMERGENCY PREPAREDNESS PROGRAM

An emergency preparedness program SHALL be established, implemented, and maintained. Key elements of the program include the following:

- An LLNL Emergency Plan.
- Zone 2A and 2B Self-Help Plan.
- Personnel response procedures (e.g., small incident response, large incident response).

### 5.4.7 QUALITY ASSURANCE PROGRAM

A quality assurance (QA) program SHALL be established, implemented, and maintained in accordance with 10 CFR 830, Subpart A, “Quality Assurance Requirements.” This program ensures that the design, construction, modification, configuration, and operation of safety-class and safety-significant SSCs meet applicable DOE and LLNL engineering and safety standards. A graded approach is used during the quality assurance review of the following key elements:

- Review of design and construction drawings.
- Inspection and acceptance testing.
- Document and records control.
- Control of purchased items/services.
- Management assessments.

### 5.4.8 OCCURRENCE REPORTING

A program SHALL be established, implemented, and maintained for occurrence reporting of events and conditions that have safety, health, or environmental implications. This program ensures that both National Nuclear Security Administration (NNSA) and LLNL management are informed of all events that could (1) impact the health and safety of the public, (2) seriously impact the intended purpose of NNSA facilities, (3) have a noticeably adverse effect on the environment; or (4) endanger the health and safety of workers. The program includes the following key elements:

- Preservation of the scene.
- DOE and management notification.
- Incident and causal analysis.
- Development of action items.
- Event or condition categorization.

### 5.4.9 HAZARDOUS MATERIAL PROTECTION PROGRAM

A hazardous material protection program SHALL be established, implemented, and maintained to ensure that hazardous material exposure to employees, subcontractors, visitors, the public, and the environment is controlled to safe levels consistent with the ALARA principle. The program includes the following key elements:

- Chemical waste acceptance in the Waste Storage Facilities is controlled to below the Single Container Inventory Limit (SCIL).
- Prohibition of eating, drinking, use of tobacco products, and applying cosmetics.
- Incompatible chemical segregation.
- Hazardous material monitoring procedures.

### 5.4.10 RADIOACTIVE AND HAZARDOUS MATERIALS SHIPPING, TRANSFER, AND RECEIVING PROGRAM

A radioactive and hazardous materials shipping, transfer, and receiving program SHALL be established, implemented, and maintained to ensure that operations involving the packaging and transfer of radioactive and hazardous materials, substances, and wastes are conducted in a manner that protects the health and safety of employees, subcontractors, visitors, the public, and the environment. The program includes the following key elements:

- Traffic control (e.g., 15 mph speed limit, entrance gate).
- Two workers minimum when moving TRU WASTE.
- Radioactive and hazardous materials identification, classification, verification, and labeling.
- Radioactive and hazardous materials packaging, handling, shipping, receiving and inventory.
- Reporting of nonconformance and corrective actions.

### 5.4.11 MAINTENANCE PROGRAM

A maintenance program SHALL be established, implemented, and maintained to ensure effective measures are taken so that SSCs are capable of performing their intended contribution to safety. This program includes the following key elements:

- Periodic inspection/surveillance of SSCs and facility conditions.
- Development, approval, and control of maintenance procedures and records.
- Post-maintenance testing.
- Master Equipment List.

## 5.5 MINIMUM STAFFING REQUIREMENTS

RHWM facilities normally operate on a single day shift, Monday through Friday. There are no minimum staffing requirements for passive operations such as storage. The Facility Manager determines the minimum staffing requirements for operation of the WASTE STORAGE FACILITIES.

**Table 5-1. Minimum Staffing Requirements.**

| Required Staffing | During normal working hours | After normal working hours |
|---|---|---|
| Health and safety (H&S) technician[a] | 1[b] | 1[c] |
| Facility Manager (or designee) | 1[b] | 1[c] |

a The H&S technician or equivalent health and safety representative approved by the Facility Manager.

b LLNL Onsite – not required to be in the facility.

c On call or call back (Call back uses a phonelist to contact appropriate response personnel).

## 5.6 OPERATING SUPPORT

Weapons and Complex Integration, ES&H Team 1, Nuclear Operations, and Maintenance Utility Services Department (MUSD) provide technical support for radiation safety, fire protection, industrial hygiene, industrial safety, environmental analysis, safety basis, criticality safety, maintenance, management. For emergencies (in case of accidents involving radioactive material) after normal working hours, emergency response personnel can be contacted by calling 911. In the event of an emergency, additional LLNL support can be provided as part of the Emergency Preparedness Program.

## 5.7 FACILITY STAFF QUALIFICATIONS AND TRAINING

A training program SHALL be established, implemented, and maintained to ensure that personnel responsible for RHWM operations are trained and qualified, as applicable, to perform their assigned responsibilities safely. This program includes forklift and crane operators who handle waste containers or operate a forklift or crane in the vicinity of waste containers; such

personnel SHALL be trained and licensed in accordance with LLNL requirements, including specific reference to safe practices for lifting and handling waste containers. The *Training Implementation Matrix for the Radioactive and Hazardous Waste Management Division* (LLNL latest revision-a) addresses the requirements of DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities* (DOE 2010a).

## 5.8 RECORDKEEPING

A records retention program SHALL be established, implemented, and maintained as described in LLNL's records management policies and procedures. The program includes retention of the following documents:

- Records and logs of operations.
- Records and logs of principal maintenance activities, inspections, repairs, and replacement of principal equipment items related to safety-significant SSCs.
- All reportable events/occurrences.
- Records of training and qualifications of WASTE STORAGE FACILITIES staff.
- Records of USQ documents.

## 5.9 REVIEWS AND AUDITS

### 5.9.1 GENERAL

Qualified personnel who are independent of the WASTE STORAGE FACILITIES conduct periodic audits of operations within these facilities.

### 5.9.2 FACILITY

#### 5.9.2.1 Readiness Reviews

Before resuming or starting a new operation in the WASTE STORAGE FACILITIES, laboratory personnel SHALL follow DOE Order 425.1D, *Verification of Readiness to Startup or Restart Nuclear Facilities* (DOE 2010b), which may require an Operational Readiness Review (ORR) or a Readiness Assessment (RA). If neither an ORR nor an RA is required, a facility review will be conducted to address the readiness of facility and equipment (hardware), management and personnel, and management programs (procedures, plans, etc.).

#### 5.9.2.2 ES&H Self-Assessment

The NMTP Assurance Manager coordinates assessments in accordance with LLNL requirements and reviews assessments for response to findings and conclusions. The Facility Manager is informed of significant issues so that appropriate action can be taken.

## 5.10 DEVIATIONS FROM TECHNICAL SAFETY REQUIREMENTS

### 5.10.1 GENERAL

The TSR document SHALL be prepared, reviewed independently, and approved in accordance with 10 CFR 830, Subpart B.

### 5.10.2 COMPLIANCE

The TSRs SHALL be complied with, except for reasonable action taken in an emergency (see Section 5.10.6, below). RHWM management is responsible for ensuring that the requirements of these TSRs are met. Compliance SHALL be demonstrated by establishing, implementing, and maintaining the required SPECIFIC ADMINISTRATIVE CONTROLS (SACs) and Administrative Control (AC) Programs.

### 5.10.3 VIOLATION OF TSRS

Violation of a TSR occurs as a result of failure to comply with an AC statement.

### 5.10.4 VIOLATION OF AN ADMINISTRATIVE CONTROL

Failure to comply with the SACs in Section 5.11 constitutes a TSR violation. For the programmatic ACs listed in Section 5.4, violation occurs when the failure is of sufficient magnitude that the intent of the referenced program is not fulfilled. The U.S. Department of Energy (DOE) SHALL have the right, in consultation with RHWM facility management, to determine if a particular noncompliance will be considered a TSR violation.

### 5.10.5 RESPONSE TO A TSR VIOLATION OF A SPECIFIC ADMINISTRATIVE CONTROL OR ADMINISTRATIVE PROGRAM

If a Specific Administrative Control or Administrative Program has been violated, proceed as follows:

- Evaluate and, if necessary, place the facility in a safe condition.
- Notify DOE of the violation in accordance with applicable LLNL procedures and DOE orders and regulations.
- Prepare an Occurrence Report in accordance with applicable LLNL procedures and DOE orders and regulations.
- Carry out the corrective actions to comply with the Specific Administrative Control or Administrative Program.

### 5.10.6 EMERGENCY ACTIONS

Emergency actions MAY be taken that depart from a requirement in the TSR provided that:

- An emergency situation exists;
- These actions are needed immediately to protect the public health and safety; and
- No action consistent with the TSR can provide adequate or equivalent protection.

Such emergency actions SHALL be authorized by the facility manager, designee or incident commander and performed by personnel trained and qualified for the equipment or systems needed to perform the actions. If an emergency action is taken, both verbal notification and a written report SHALL be made within 24 hours to the DOE Livermore Site Office Manager or designee.

## 5.11 SPECIFIC ADMINISTRATIVE CONTROLS

This section establishes the SPECIFIC ADMINISTRATIVE CONTROLS (SACs) committed to in the WASTE STORAGE FACILITIES DSA. These SACs preserve critical assumptions in the safety analyses. Table 5-2 lists the SACs for the WASTE STORAGE FACILITIES. **Note:** For location specific controls, buildings are considered separate from their associated yard areas.

**Table 5-2. Directive Action Specific Administrative Controls.**

| |
|---|
| **TRU Waste Container Controls** |
| • All TRU WASTE accepted into the WASTE STORAGE FACILITIES SHALL be packaged in TRU WASTE CONTAINERS. |
| • The lids for TRU WASTE CONTAINERS SHALL not be removed in the WASTE STORAGE FACILITIES. |
| **TRU Waste Container Activity Limits** |
| • The radiological activity of 55-gallon drum and Standard Waste Box TRU WASTE CONTAINERs located in B625 and A625 Yard SHALL be limited to 50 PE-Ci each, based on LLNL assay and review processes. |
| • For B625 and A625 Yard, Pipe Overpack Containers (POCs) SHALL be used for radiological activities greater than 30 PE-Ci. |
| • The radiological activity of Standard Waste Box TRU WASTE CONTAINERS located in B696R and B693 Yard SHALL be limited to 12 PE-Ci each, based on LLNL assay and review processes. |
| • The radiological activity of 55-gallon drum TRU WASTE CONTAINERS located in B696R and B693 Yard SHALL be limited to 2 PE-Ci each, based on LLNL assay and review processes. |
| • The radiological activity of unvented Oversized Box TRU WASTE CONTAINERS located at B625, B696R, A625 Yard, and B693 Yard SHALL be limited to 4 PE-Ci each, based on LLNL assay and review processes. |
| **Tritium Activity Limits** |
| • In B625, the aggregate of all tritium SHALL be limited to a total of 10,000 Ci. |
| • In B696R, the aggregate of all tritium SHALL be limited to a total of 10,000 Ci. |
| • In B693, tritium SHALL be limited to a total of 4,000 Ci per room and the aggregate of all tritium SHALL be limited to a total of 10,000 Ci for the entire building. |
| • In A625 Yard, the aggregate of all tritium SHALL be limited to a total of 40,000 Ci. |
| • In B693 Yard, the aggregate of all tritium SHALL be limited to a total of 40,000 Ci. |
| **Storage Geometry Controls** |
| • In B625, TRU WASTE CONTAINERS SHALL be stored within the B625 TRU WASTE CONTAINER STORAGE FOOTPRINT. |
| • In B696R, TRU WASTE CONTAINERS SHALL be stored within the B696R TRU WASTE CONTAINER STORAGE FOOTPRINT. |
| • The bottom of stacked TRU WASTE CONTAINERS SHALL not be more than 4 ft above the floor. |

**Table 5-2. Directive Action Specific Administrative Controls (*cont.*).**

| **Combustible Loading Controls** |
|---|
| • Any COLLECTION OF COMBUSTIBLES in B625 or B696R SHALL be limited to a total of 100 lbs of ordinary combustibles equivalent, excluding DE MINIMIS COMBUSTIBLES. |
| • A COLLECTION OF COMBUSTIBLES in B625 or B696R SHALL have a separation distance of at least 1.7 m from TRU WASTE CONTAINERS and a separation distance of at least 2.1 m from any other COLLECTION OF COMBUSTIBLES. |
| • The B625 Phone Board SHALL have a separation distance of 1.0 m from TRU WASTE CONTAINERS and a separation distance of 1.5 m from any COLLECTION OF COMBUSTIBLES. |
| **Site Boundary Distance Controls** |
| • No TRU WASTE CONTAINERS SHALL be stored in B696R R1011. |
| • TRU WASTE CONTAINERS SHALL not be staged less than 130 m from the Greenville Road fence line (i.e., east of the B693 structure). |
| **Release Mechanism Exclusion Controls** |
| • No TRU WASTE CONTAINERS SHALL be stored in B693. |
| • No flammable gas or liquid fueled vehicles or equipment SHALL be allowed in B625 or B696R. |
| • TRUPACT-II loading/unloading SHALL not be authorized. |
| • The B625 Bridge Crane SHALL be locked and tagged out in a position with the floor space below the bridge I-beam at least 3-ft away from stored TRU WASTE CONTAINERS. |

# SECTION 6
# DESIGN FEATURES

This section describes those design features that, if altered or modified, would have a significant effect on safe operations. These design features SHALL be controlled to maintain their design (as specified in applicable design drawings and specifications) as of the effective date of this TSR document. Modifications or replacements SHALL maintain the same design features and functions as the original, including materials, methods of construction, physical dimensions, and other parameters specified in applicable industry codes and standards, unless engineering analysis demonstrates equivalency.

There are four design features applicable to the WASTE STORAGE FACILITIES, all of which are passive safety-significant SSCs:

- TRU Waste Containers.
- B696 Structural System.
- B625 Structural System.
- B696S/B696R Partition.

**TRU Waste Containers**

TRU WASTE CONTAINERS are standard 55-gal drums, POCs, standard waste boxes (SWBs), TRU oversize boxes, and other steel containers meeting the definition of TRU WASTE CONTAINERS. The safety functions of TRU WASTE CONTAINERS are to protect workers from radioactive contamination and provide a physical barrier that mitigates significant releases in the event of mechanical impacts or thermal stresses.

Each TRU WASTE CONTAINER containing TRU WASTE SHALL be visually inspected weekly to ensure its integrity (i.e., corrosion) and verify that it is intact and closed. Each TRU WASTE CONTAINER containing TRU WASTE SHALL be visually inspected when accepted in the nuclear facility to ensure it has a vent installed that is designed to relieve flammable gases that may be generated inside the waste container.

EXCEPTION: TRU oversize boxes and LLW/TRU conversions are not required to have filter vents.

EXCEPTION: This requirement applies only to the exterior, 55-gallon drum serving as the outer shell of a POC. The interior pipe container is not inspected.

### B696 Structural System

B696 is a steel brace frame designed structure. The safety function of the B696 Structural System is to maintain structural integrity. The B696 Structural System SHALL be inspected every five years and promptly after a major event to verify the structure has not been damaged or modified such that it is inconsistent with its PC-2 design.

### B625 Structural System

B625 is a one-story building with a steel braced frame structure. The safety function of the B625 Structural System is to maintain structural integrity. The B625 Structural System SHALL be inspected every five years and promptly after a major event to verify the structure has not been damaged or modified such that it is inconsistent with its PC-2 design.

### B696S/B696R Partition

The B696S/B696R Partition is the wall at column line 6 (the wall separating the low bay B696R and high bay B696S). The safety function of the B696S/B696R Partition is to isolate a fire in one segment from the other segment (B696S and B696R). The B696S/B696R Partition SHALL be inspected every five years and promptly after a major event to verify the B696S/B696R Partition has not been damaged or modified such that it is inconsistent with its 2-hour fire-resistance rating design. The B696S/B696R Partition SHALL be inspected every five years and promptly after a major event to verify the structure has not been damaged or modified such that it is inconsistent with its PC-2 design.

# SECTION 7
# REFERENCES

49 CFR 173.465, *Code of Federal Regulations*, Title 49, Transportation, Part 173.465, "Type A Packaging Tests." Office of the Federal Register, Washington, DC.

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ICRP 71/72, "Age-Dependent Doses to Members of the Public from Intake of Radionuclides," International Commission on Radiological Protection, 1996.

Laycak (2011), WSF-DCF-1104, *Default Radioactive and Hazardous Waste Management (RHWM) Dose Conversion Factors (DCFs) and Weighting Factors and plutonium-239 equivalent Curie (PE-Ci) methodology for acceptance into the Waste Storage Facilities*, Lawrence Livermore National Laboratory, Livermore, California, Rev. 0, November 22, 2011.

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Laycak (2014b), WSF-AIRCRAFT-FREQUENCY-B696R-TRU-1429, *Frequency of general aviation aircraft crash directly into B696R TRU Waste Container Storage Footprint*, Lawrence Livermore National Laboratory, Livermore, California, Rev. 0, December 2014.

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Laycak (2014d), WSF-AIRCRAFT-FUEL-1427, *Source Term of Accidents Involving Aircraft Crashes and Fuel Fires*, Lawrence Livermore National Laboratory, Livermore, California, Rev. 0, December 2014.

LLNL (latest revision-a), *Training Implementation Matrix for the Radioactive and Hazardous Waste Management Division*, Lawrence Livermore National Laboratory, Livermore, CA (UCRL-AR-116655).

LLNL (latest revision-b), *NMTP Nuclear Facility Configuration Management Plan*, Lawrence Livermore National Laboratory, CA.

LLNL (2011), *Documented Safety Analysis for the Waste Storage Facilities*, Lawrence Livermore National Laboratory, Livermore, CA, (LLNL-TR-425142), June 2011.

Washington TRU Solutions LLC, POC-SPC-0001, Rev. 0, "Specification for Fabrication of the Pipe Overpack (Standard, S100, S200, and S300," Prepared for the U.S. Department of Energy, August 2012.

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# Appendix A
# SL AND LCO Bases

No safety limits (SLs) or limiting conditions for operations (LCOs) have been identified as necessary to support the safety analyses of the WASTE STORAGE FACILITIES. Thus, no bases explaining the reasons for SLs or LCOs have been included in this TSR document. Appendix A was retained for consistency with the TSR section numbering system.

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# Appendix B
# Bases for Specific Administrative Controls

## BASES OF SACS

This appendix contains a summary of administrative controls for the WASTE STORAGE FACILITIES that perform a specific preventive or mitigative function for the accident scenarios described in the DSA. The safety function of these administrative controls has importance similar to the safety function of a safety SSC. The SACs are judged to provide significant preventive or mitigative functions for potential accident scenarios or are identified as initial condition assumptions used in the unmitigated and mitigated consequence evaluation in the hazard analyses. This summary is provided so that the WASTE STORAGE FACILITIES operations staff knows the exact conditions that have to be met and the associated basis.

This appendix is divided into two main sections: SACs related to inventory, and SACs related to storage and handling. Each SAC contains three sections: Critical Safety Function, Control Description, and Basis.

## B.1 TRU WASTE CONTAINER CONTROLS

### B.1.1 CRITICAL SAFETY FUNCTION

These SACs preserves the confinement assumptions applied in accident scenarios involving containerized TRU WASTE.

### B.1.2 CONTROL DESCRIPTION

- All TRU WASTE accepted into the WASTE STORAGE FACILITIES SHALL be packaged in TRU WASTE CONTAINERS.
- The lids for TRU WASTE CONTAINERS SHALL not be removed in the WASTE STORAGE FACILITIES.

### B.1.3 BASIS

DOE-STD-5506-2007 specifies damage ratios associated with TRU WASTE CONTAINERS. The hazard and accident analysis uses those damage ratios. Placement of TRU WASTE into TRU WASTE CONTAINERS (and the certification of those containers) is performed outside of the WASTE STORAGE FACILITIES.

The hazard and accident analyses assume that waste is maintained in metal containers with closed lids. Certification of a TRU WASTE CONTAINER involves sealing the lid. Removing the lids of TRU WASTE CONTAINERS is outside the scope of work at the WASTE STORAGE FACILITIES. Temporary removal and replacement filter vents is allowed for maintenance, non-intrusive inspection, and sampling activities. Filter vents do not contribute to the overall structural integrity of a metal container; the removal of the filter vents does not affect the overall structural integrity of a metal container.

## B.2 TRU WASTE CONTAINER ACTIVITY LIMITS

### B.2.1 CRITICAL SAFETY FUNCTION

These SACs preserves the MAR assumption for events involving TRU WASTE CONTAINERS.

### B.2.2 CONTROL DESCRIPTION

- The radiological activity of 55-gallon drum and Standard Waste Box TRU WASTE CONTAINERs located in B625 and A625 Yard SHALL be limited to 50 PE-Ci each, based on LLNL assay and review processes.
- For B625 and A625 Yard, Pipe Overpack Containers (POCs) shall be used for radiological activities greater than 30 PE-Ci.
- The radiological activity of Standard Waste Box TRU WASTE CONTAINERS located in B696R and B693 Yard SHALL be limited to 12 PE-Ci each, based on LLNL assay and review processes.
- The radiological activity of 55-gallon drum TRU WASTE CONTAINERS located in B696R and B693 Yard SHALL be limited to 2 PE-Ci each, based on LLNL assay and review processes.
- The radiological activity of unvented Oversized Box TRU WASTE CONTAINERS located at B625, B696R, A625 Yard, and B693 Yard SHALL be limited to 4 PE-Ci each, based on LLNL assay and review processes.

### B.2.3 BASIS

These SACs limit the amount of radioactive material that can be impacted by postulated accidents involving TRU waste.

The value of 50 PE-Ci in B625 and A625 Yard for 55-gal drums and SWBs takes into account the distance to the site boundary and the statistical MAR process from DOE-STD-5506-2007. This value also takes into account the number of containers that can be impacted by accident scenarios using the area of a 55-gal drum as the base footprint.

The value of 30 PE-Ci that requires use of a POC minimizes or eliminates the consequence potential associated with higher curie content drums. Per DOE-STD-5506-2007, POCs have a damage ratio of zero for severe stress events.

The value of 12 PE-Ci in B696R and B693 Yard for SWBs takes into account the distance to the site boundary. This value also takes into account the number of containers that can be impacted by accident scenarios using the area of a Standard Waste Box TRU Waste Containers as the base footprint.

The value of 2 PE-Ci in B696R and B693 Yard for 55-gal drums takes into account the distance to the site boundary. This value also takes into account the number of containers

that can be impacted by accident scenarios using the area of a 55-gal drum as the base footprint.

The value of 4 PE-Ci for oversized boxes takes into account the distance to the site boundary. This value also bounds the highest activity unvented oversized box that could deflagrate.

**Note 1**: The Waste Storage Facilities are also required to comply with National Environmental Policy Act (NEPA) analysis in the current LLNL Environmental Impact Statement (DOE 2005) and it's Supplemental Analysis (DOE 2011). The NEPA analysis establishes a bounding consequence based on overall facility inventory parameters. NEPA analysis requires that drum loading and configuration remain within the NEPA bounding consequence calculations.

**Note 2:** the definition of PE-Ci is: A unit of radiological activity. PE-Ci values are determined from summing the Curie value of radionuclides that have been normalized to plutonium-239 Solubility Class S based on the Dose Conversion Factors of International Commission on Radiological Protection Publication 71/72 (ICRP-71/72), as described in calculation WSF-DCF-1104 (Laycak 2011).

**Note 3**: TRU waste in a sealed Type B container (e.g., TRUPACT-II, HalfPACT) and loaded onto a truck is regulated by the Department of Transportation.

**Note 4:** For location specific controls, buildings are considered separate from their associated yard areas.

**Note 5:** Vented oversized boxes in B696R have the same limit as SWBs (i.e., 12 PE-Ci).

## B.3 TRITIUM ACTIVITY LIMITS

### B.3.1 CRITICAL SAFETY FUNCTION

These SACs preserves the MAR assumption for events involving tritium.

### B.3.2 CONTROL DESCRIPTION

- In B625, the aggregate of all tritium SHALL be limited to a total of 10,000 Ci.
- In B696R, the aggregate of all tritium SHALL be limited to a total of 10,000 Ci.
- In B693, tritium SHALL be limited to a total of 4,000 Ci per room and the aggregate of all tritium SHALL be limited to a total of 10,000 Ci for the entire building.
- In A625 Yard, the aggregate of all tritium SHALL be limited to a total of 40,000 Ci.
- In B693 Yard, the aggregate of all tritium SHALL be limited to a total of 40,000 Ci.

### B.3.3 BASIS

These SACs limit the amount of radioactive material that can be impacted by postulated accidents involving tritium.

The value of 10,000 Ci in B625 takes into account the distance to the site boundary and the lack of plume lofting in the case of a fire. This value also takes into account the size of the room for dilution of tritium that can affect workers within the room.

The value of 10,000 Ci in B696R takes into account the distance to the site boundary and the lack of plume lofting in the case of a fire. This value also takes into account the size of the room for dilution of tritium that can affect workers within the room.

The value of 10,000 Ci in B693 takes into account the distance to the site boundary and the lack of plume lofting in the case of a fire. The value of 4,000 takes into account the size of the room for dilution of tritium that can affect workers within the room.

The value of 40,000 Ci in A625 Yard takes into account the distance to the site boundary.

The value of 40,000 Ci in B693 Yard takes into account the distance to the site boundary.

**Note:** For location specific controls, buildings are considered separate from their associated yard areas.

## B.4 STORAGE GEOMETRY CONTROLS

### B.4.1 CRITICAL SAFETY FUNCTION

These SACs preserve the TRU Waste Container storage geometries assumed in the DSA.

### B.4.2 CONTROL DESCRIPTION

- In B625, TRU WASTE CONTAINERS SHALL be stored within the B625 TRU WASTE CONTAINER STORAGE FOOTPRINT.
- In B696R, TRU WASTE CONTAINERS SHALL be stored within the B696R TRU WASTE CONTAINER STORAGE FOOTPRINT.
- The bottom of stacked TRU WASTE CONTAINERS SHALL not be more than 4 ft above the floor.

### B.4.3 BASIS

The determination of the BEU frequency for an aircraft crash directly impacting TRU Waste Containers in B625 is based on the geometry described in calculation WSF-AIRCRAFT-FREQUENCY-B625-TRU-1428 (2014a). This control also determines the total numbers of containers in B625 during a BEB Earthquake building collapse.

The determination of the BEU frequency for an aircraft crash directly impacting TRU Waste Containers in B696R is based on the geometry described in calculation WSF-AIRCRAFT-FREQUENCY-B696R-TRU-1429 (2014b). This control also determines the total numbers of containers in B696R during a BEB Earthquake building collapse.

The hazard and accident analysis assumes that the total number of drums involved in release events (e.g., spills, fires, aircraft crash) is limited to a specific geometry, including a 4-ft stack limit. This is documented in calculation WSF-AIRCRAFT-FREQUENCY-B625-TRU-1428, WSF-AIRCRAFT-FREQUENCY-B696R-TRU-1429, WSF-VEHICLE-FUEL-1419 (Laycak 2014c), and WSF-AIRCRAFT-FUEL-1427 (Laycak 2014d). In addition, this SAC minimizes the potential for container failure from toppling since TRU Waste Containers are designed to withstand a 4-ft drop. TRU Waste Containers are designed to survive at least a 4-ft drop consistent with the performance criteria for Type A packaging [49 CFR 173.465(c)(1)].

**Note 1:** For location specific controls, buildings are considered separate from their associated yard areas.

**Note 2**: Using the distance unit of measure of feet instead of meters is deliberate for these SACs. The stacking height of 4-ft is based on 49 CFR 173.465(c)(1). The 4-ft x 4-ft dimensions of pallets is an industry standard. The array spacing distance of a nominal 2.5-ft is based on life-safety requirements. These values could be converted to meters, but it is preferred to have simple, rounded numbers instead of values with odd decimal places.

## B.5 COMBUSTIBLE LOADING CONTROLS

### B.5.1 CRITICAL SAFETY FUNCTION

These SACs preserves the combustible loading assumptions for fire events.

### B.5.2 CONTROL DESCRIPTION

- Any COLLECTION OF COMBUSTIBLES in B625 or B696R SHALL be limited to a total of 100 lbs of ordinary combustibles equivalent, excluding DE MINIMIS COMBUSTIBLES.

- A COLLECTION OF COMBUSTIBLES in B625 or B696R SHALL have a separation distance of at least 1.7 m from TRU WASTE CONTAINERS and a separation distance of at least 2.1 m from any other COLLECTION OF COMBUSTIBLES.

- The B625 Phone Board SHALL have a separation distance of 1.0 m from TRU WASTE CONTAINERS and separation distance of 1.5 m from any COLLECTION OF COMBUSTIBLES.

### B.5.3 BASIS

The 100 lb mass limit is a credited assumption in the hazard and accident analysis and is derived from calculation WSF-CFAST-1401 (Laycak 2014c). This amount (in combination with the separation distance SAC) ensures that there is not enough heat flux to cause seal failure of TRU waste Containers and not to reach the critical heat flux to ignite other collections of combustibles.

The separation distance is a credited assumption in the hazard and accident analysis and is derived from calculation WSF-CFAST-1401 (Laycak 2014c). This separation distance (in combination with the mass limit SAC) ensures that there is not enough heat flux to cause seal failure of TRU waste Containers and not to reach the critical heat flux to ignite other collections of combustibles.

The B625 Phone Board control is a credited assumption in the hazard and accident analysis and is derived from calculation WSF-CFAST-B625-Board-1409 (Laycak 2014d). This SAC ensures that there is not enough heat flux to cause seal failure of TRU waste Containers and not to reach the critical heat flux to ignite other collections of combustibles.

**Note 1:** For location specific controls, buildings are considered separate from their associated yard areas.

**Note 2**: Using the distance unit of measure of meters instead of feet is deliberate for these SACs. CFAST uses meters as its unit of measure for distances. In addition, the heat flux values are based on $kW/m^2$. These values could be converted to feet, but it is preferred to have simple, rounded numbers instead of values with odd decimal places.

## B.6 SITE BOUNDARY DISTANCE CONTROLS

### B.6.1 CRITICAL SAFETY FUNCTION

These SACs preserve the distances of stored TRU Waste Container to the site boundary assumed in the DSA.

### B.6.2 CONTROL DESCRIPTION

- No TRU WASTE CONTAINERS SHALL be stored in B696R R1011.
- TRU WASTE CONTAINERS SHALL not be staged less than 130 m from the Greenville Road fence line (i.e., east of the B693 structure).

### B.6.3 BASIS

This SAC limits TRU Waste in B696R to be stored in R1010 instead of 1011. Releases of TRU Waste in B696R R1011 were not analyzed. R1011 is closer to the site boundary.

This SAC limits TRU Waste in the B693 Yard to not be closer than 130 to the site boundary. Releases of outdoor TRU Waste closer than 130 m were not analyzed.

**Note 1:** For location specific controls, buildings are considered separate from their associated yard areas.

**Note 2**: Using the distance unit of measure of meters instead of feet is deliberate for these SACs. MACCS2 uses meters as its unit of measure for distances. These values could be converted to feet, but it is preferred to have simple, rounded numbers instead of values with odd decimal places.

## B.6 RELEASE MECHANISM EXCLUSION CONTROLS

### B.6.1 CRITICAL SAFETY FUNCTION

These SACs preserve the exclusion of specific release mechanisms that were not evaluated.

### B.6.2 CONTROL DESCRIPTION

- No TRU WASTE CONTAINERS SHALL be stored in B693.
- No flammable gas or liquid fueled vehicles or equipment SHALL be allowed in B625 or B696R.
- TRUPACT-II loading/unloading SHALL not be authorized.
- The B625 Bridge Crane SHALL be locked and tagged out in a position with the floor space below the bridge I-beam at least 3-ft away from stored TRU WASTE CONTAINERS.

### B.6.3 BASIS

B693 can contain flammable liquid waste. Events involving TRU Waste Containers and flammable liquid inside buildings were not evaluated. This SAC preserves the assumption that TRU Waste is not stored in buildings with flammable liquid.

Events involving TRU Waste Containers and flammable fueled vehicles or equipment inside buildings with no openings or breaches were not evaluated. This SAC preserves the assumption that TRU Waste is not stored in closed buildings with flammable fueled vehicles or equipment. **Note:** Exposure of TRU Waste Containers to flammable liquids outside of a building is bounded by the Vehicle Crash accident scenario with no vehicle impact.

Releases from TRUPACT-II loading/unloading crane drops were not evaluated.

The B625 Bridge Crane control precludes crane impact to stored drums from a seismic event.

**Exception:** Transient TRU Waste Containers may be moved through the floor spacing below the B625 Bridge Crane.

For location specific controls, buildings are considered separate from their associated yard areas.

**Note**: Using the distance unit of measure of feet instead of meters is deliberate for these SACs. The dimensions of the B625 Bridge Crane are in feet. These values could be converted to feet, but it is preferred to have simple, rounded numbers instead of values with odd decimal places.

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